

# **CURRICULUM VITAE**

## **MICHAEL C. MADDEN**

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### **PERSONAL INFORMATION:**

Work Address: Research Biologist  
National Health and Environmental Effects Research  
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### **Research Interests**

Exposure to ambient air particulate matter (PM) has been associated with increased human deaths and cardiopulmonary morbidity, such as lung infections and increased asthma symptoms. I am investigating some types of PM and associated gases (such as aldehydes) that may be associated with those health effects so that the US EPA may be able to better regulate or manage the sources of the PM which are identified as playing a role in the adverse health outcomes. I am currently focusing on the effects of diesel exhaust using a variety of approaches ranging from exposing cultured human cells to the exhaust, to studying responses of humans exposed out in traffic. The EPA rules for diesel exhaust from large trucks to be implemented in 2007 and 2010 will drastically change the type of emissions, and I am currently designing and implementing testing strategies to assess the toxicity of the future types of diesel emissions. Additionally some of my research effort attempts to identify what populations are more sensitive to the effects of air pollutants, and the genetic and environmental reasons behind the increased sensitivity.

**Research Synopsis:**

Human health effects from air pollution; Diesel exhaust toxicology; Aldehyde toxicology;  
Role of lung lipid metabolism in responses to pollutants; Sensitive populations

**EDUCATION:**

1973 - 1977 B. S., Biology, Manhattan College, Bronx, New York

1977-1980 M.S., Zoology, University of Georgia, Athens

1980-1986 Ph.D., Toxicology, University of North Carolina at Chapel Hill

**PROFESSIONAL TRAINING AND EXPERIENCE:**

2003-present: Research Biologist, U.S. Environmental Protection Agency, GS-14 grade,  
Research Triangle Park, NC

1998-2003: Research Biologist, U.S. Environmental Protection Agency, GS-13 grade, Research  
Triangle Park, NC

1995-1998: Research Biologist, U.S. Environmental Protection Agency, GS-12 grade, Research  
Triangle Park, NC

1995-Present: Adjunct Assistant Professor, Curriculum in Toxicology, University of North  
Carolina at Chapel Hill

1993-Present: Adjunct Assistant Professor, Dept. of Environmental Sciences and Engineering,  
School of Public Health, University of North Carolina at Chapel Hill (appointed through  
11/30/01)

1989- 1994: Research Associate, Center for Environmental Medicine and Lung Biology,  
University of North Carolina at Chapel Hill

1986-1989: Postdoctoral Fellow Trainee, Center for Environmental Medicine, University of  
North Carolina at Chapel Hill.

1983-1988: Lectured in ENVR 143, Dept. of Environmental Sciences & Engineering, University  
of North Carolina at Chapel Hill.

1980-1986: Research Assistant, Dept. of Medicine, University of North Carolina at Chapel Hill.

1980: Research Technician, Skidaway Institute of Oceanography, Savannah, Georgia.

1978-1980: Teaching Assistant, University of Georgia

1978- 1979: Research Assistant, Skidaway Institute of Oceanography, Savannah, Georgia

1975-1977: Chemistry Laboratory Assistant, Manhattan College.

**PROFESSIONAL HONORS, ASSOCIATIONS, and RESPONSIBILITIES:****Membership in Professional Societies:**

Phi Beta Kappa

Sigma Xi

Society of Toxicology, North Carolina Chapter

Society of Toxicology, National Chapter:

SOT Inhalation Specialty Section: Councilor 2003-2005

**Editorial Responsibilities:**

**Associate Editor** Inhalation Toxicology (2004-Present)

**Ad Hoc Grant Reviewer** (last 5 years):

University of North Carolina Center for Environmental Health and Susceptibility  
Natural Environment Research Council (NERC), U.K.

**INVITED SCIENTIFIC PRESENTATIONS AND SEMINARS (last 5 years):**

- “Diesel exhaust particulate health effects-results from in-vitro and in-vivo studies” Seminar, University of Washington, Oct. 24, 2002.
- “Novel insights into the toxicology of lung oxidative stress”, SOT Symposium, March 11, 2003; Salt Lake City, UT (Session co-chair with Maria Kadiiska).
- “In vitro and In vivo evaluation of toxicity of particles from different sources”, HEI Diesel Emissions Toxicity, November 6-7, 2003, Denver, CO.
- “Lipomics, an important component of metabolomics, and possible use in toxicology studies” SOT Meeting, March 22, 2004, Baltimore, MD. (Symposium co-chair with David White).
- “Strategies to identify bioactive substances in complex air pollutant mixtures”. SOT Meeting, March 24, 2004, Baltimore, MD. (Workshop co-chair with Jack Harkema)
- “Controlled diesel exposures: Inter-phasing human and animal studies and their use in the risk assessment process”. SOT Meeting, March 21-25, 2004, Baltimore, MD.
- “Diesel Exhaust Exposure Studies: Some Key Questions Related to Health Effects, and Implications for Indoor Air Research” Syracuse University, October 24, 2005. Part of the 2005 Syracuse Symposium on Environmental and Energy Programs.
- Invited Panelist for Discussion of Session entitled “Diesel Emissions: Recent Developments in Emissions, Health Effects and Impacts on Risk Assessment”. 31<sup>st</sup> Winter Meeting, The Toxicology Forum. Washington DC, March 31, 2006.
- “Comprehensive Responses of Lipid Classes to Toxicants and Involvement in Diseases”. SOT Meeting, March 7, 2006, San Diego, CA. (co-chair with Ron Riley)
- “Diesel Exhaust Research: What Has It Told Us About Ambient Organic PM Toxicity”. EPRI Workshop on Organic Aerosols EPRI Workshop Palo Alto CA October 24-25, 2006.
- “Complex issues with examining diesel exhaust toxicity: Is the task getting easier or harder?” BfR Federal Institute for Risk Assessment, Alternative Test Methods in Inhalation Toxicology Congress. Berlin, Germany. May 7-9, 2007.

**UNDERGRADUATE, GRADUATE, AND POSTGRADUATE TRAINING RECORD:****Graduate and Professional Student Mentorship:**

1. David Wright, Master of Science 1992, Curriculum in Toxicology, University of North Carolina at Chapel Hill. [Committee Member]
2. J. Philip Smith, 1992-1994. Curriculum in Toxicology, University of North Carolina at Chapel Hill.

3. Katherine Kraft, 1993-1999. Curriculum in Toxicology, University of North Carolina at Chapel Hill.
4. Jiann-Gwu Lee, 1993-1995. Cell Biology Program, North Carolina State University.
5. Monique Richards, 2000. Curriculum in Toxicology, University of North Carolina at Chapel Hill. [Lab rotation].
6. Alejandro Molinelli, 2001-2006. Doctor of Philosophy. Curriculum in Toxicology, University of North Carolina at Chapel Hill. [Research Advisor].
7. Demetra Stamm, 2001. School of Medicine, University of North Carolina at Chapel Hill. [Lab rotation].
8. Sailaja Mundandhara, 2002-2004. Postdoctoral Fellow, University of North Carolina-Chapel Hill, Center for Environmental Medicine, Asthma, and Lung Biology. [Mentor]
9. Keegan Sawyer [formerly Musgrove-Wesley]. 2003-present. Department of Environmental Sciences and Engineering. [Research Advisor PhD]
10. Miyoung Yoon. 2003-present. National Research Council Postdoctoral Fellow. [Co-mentor with Hugh Barton]
11. Weiyan Zhu. 2004-present. Postdoctoral Fellow, University of North Carolina-Chapel Hill Center for Environmental Medicine, Asthma, and Lung Biology. [Co-mentor with Ian Gilmour]
12. Lars Perlmutter, 2007-present. Department of Environmental Sciences and Engineering. [Research Advisor M.S.]
13. Jonathan Shannahan, . Summer 2007. Curriculum in Toxicology, University of North Carolina at Chapel Hill; Laboratory Rotation.

#### **Undergraduate Student Mentorship:**

1. Sadhana Char, 1993. University of North Carolina at Chapel Hill.
2. Sujankumar Patel, 1993. University of North Carolina at Chapel Hill.
3. Ripa Patel, 1994. University of North Carolina at Chapel Hill.
4. Margaret Brewinski, 1997. St. Andrew's Prebyterian College, Laurinburg, NC.
5. Dawn Reilly, 1997-1998. University of North Carolina at Chapel Hill.
6. Anna Calderon, 1997. Universidad Autonoma Metropolitana, Mexico City, Mexico
7. Charles Marshall, 1998. St. Andrew's Prebyterian College, Laurinburg, NC.
8. Ahtavea Castellanos. 2002. Texas Southern University, Houston, TX.

#### **RECENT PUBLICATIONS:**

- *Madden, MC*, Dailey, LA, Stonehuerner, JG, Harris, DB. Responses of Cultured Human Airway Epithelial Cells Treated with Diesel Exhaust Extracts Will Vary with the Engine Load . *J. Toxicol. Environ. Health., Part. A.* 66:2281-2297. 2003.
- Jaspers, I, J Ciencewicky, W Zhang, LE Brighton, JL Carson, M Beck, *M Madden*. Diesel exhaust extract enhances influenza virus replication in human respiratory epithelial cells. *Toxicol. Sci.* 85:990-1002. 2005.

- Singh, P., *Madden, MC*, Gilmour, MI. Comparative adjuvant effects of diesel exhaust particles and carbon black in house dust mite-allergic brown Norway rats. *J. Immunotoxicology*. 2:1-10. 2005.
- Ghio AJ, Piantadosi CA, Wang X, Dailey LA, Stonehuerner JD, Madden MC, Yang F, Dolan KG, Garrick MD, Garrick LM.. Divalent metal transporter-1 decreases metal-related injury in the lung. *Am J Physiol Lung Cell Mol Physiol*. 2005. 289:L460-7.
- Becker S, Mundandhara S, Devlin RB, Madden M. Regulation of cytokine production in human alveolar macrophages and airway epithelial cells in response to ambient air pollution particles: Further mechanistic studies. *Toxicol Appl Pharmacol*. 2005. 207:S269-S275.
- Yoon, M., *Madden, MC*, Barton, HA. Developmental Expression of Aldehyde Dehydrogenase in Rat: a Comparison of Liver and Lung development. In press, *Toxicol. Sci*. 2006.
- S. Mundandhara , S. Becker and *M. Madden*. Effects of diesel exhaust particles on human alveolar macrophage ability to secrete inflammatory mediators in response to lipopolysaccharide. In press, *Toxicology In Vitro*. 20:614-624. 2006.
- Kongerud, J, *Madden, M.C.*, Hazucha, M., Peden, D. Asthmatic and Nonasthmatic Nasal Responses to Diesel Exhaust Particles. *Inhal. Toxicol*. 18:589-94. 2006.
- Molinelli, AR, Santacana, G, *Madden, MC*, Jiménez, BD. Cytotoxicity and Metal Content of Organic Solvent Extracts from Airborne Particulate Matter in Puerto Rico, *Environ. Res*. 102:314-25. 2006.
- Ghio AJ, Turi JL, *Madden MC*, Dailey LA, Richards JD, Stonehuerner JG, Morgan DL, Singleton S, Garrick LM, Garrick MD. Lung injury after ozone exposure is iron-dependent. *Am J Physiol Lung Cell Mol Physiol*. 2007. 292:L134-43.
- Ciencewicki, J., Brighton, L., Wu, W., *Madden, M.*, Jaspers, I. Diesel Exhaust Enhances Virus- and poly(I:C)-induced Toll-like Receptor 3 Expression and Signaling in Respiratory Epithelial Cells. *Am J Physiol Lung Cell Mol Physiol*. 2006. 290(6):L1154-63.
- Carraway MS, Suliman HB, *Madden MC*, Piantadosi CA, Ghio AJ. Metabolic capacity regulates iron homeostasis in endothelial cells. *Free Radical Biology & Medicine* 2006; 41:1662-9.
- Yoon, M., *Madden, MC*, Barton, HA. Extrahepatic metabolism in PBPK modeling of lipophilic volatile organic chemicals: Impacts on metabolic parameter estimation and prediction of dose metrics. Accepted *J Env Toxicol Health*.
- Swanson, KJ, *Madden, MC*, Ghio, AJ. Biodiesel Exhaust: The Need for Health Effects Research.. *Env. Hlth. Perspect*. 115:496-499. 2007.
- TL Leavens, MW Case, *MC Madden*, RA Pegram, DM DeMarini, BC Blount, and JL Valentine. Disposition of Bromodichloromethane in Humans Following Oral and Dermal Exposure, In press, *Tox. Sci*.
- Madden, MC*. Complex issues with examining diesel exhaust toxicity: Is the task getting easier or harder? Submitted, *Experimental and Toxicologic Pathology*.
- Pleil, JD, Hubbard, HF, Sobus, JR, and *Madden, MC*. Measurement of endogenous volatile polar metabolites in exhaled breath condensate (EBC) to gauge biological response to environmental stressors. Submitted, *J. Expos. Sci. Env. Epidemiol*.